

Information guide

Metering installations version 1.0

This guide provides information on the terms and definitions used within the Electricity Governance Rules 2003 (Rules) with respect to metering installations. Metering installations allow for the reconciliation, measurement, and storage of metering information. Part D of the Rules outlines the metering standards and rules for compliance in New Zealand.

The general approach set out in this information guide in no way reduces the requirement upon participants to know and comply with their obligations under the Rules. Neither should it be interpreted as reflecting the Electricity Commission's view on how the Rules should be interpreted. Compliance with this guide will not guarantee that a participant is in compliance with the Rules.

Abbreviations used in these guidelines

Board	Electricity Commission Board
Commission	Electricity Commission
HH	Half hour
ICP	Installation control point
Meter	Metering installation certified in accordance with the Rules
NHH	Non half hour
Regulations	Electricity Governance Regulations 2003
Rules	Electricity Governance Rules 2003
TOU	Time of use

Introduction

1. A metering installation is defined in part A of the Rules as comprising “*meters, load and meter control devices (but not their control signals or means of generation), data loggers, test blocks, measuring transformers, error compensation processes, fittings, equipment, wiring, and installations used for the measurement and storage of metering information that is used for the purposes of the rules and which comply with the metering standards*” (metering standards are as described in part D of the Rules).
2. Energy purchases and line charges are allocated equitably to the consumer based on their consumption through the use of metering installations.
3. The meters and control devices in a metering installation determine the resolution of consumption information that can be used in the reconciliation and customer billing process.

4. Part D of the Rules sets out the obligations of participants in relation to metering standards.

Metering terms

Half hour meters

5. Half hour (HH) meters are meters that record the volume of energy consumed in each half hour period. The volume is recorded as an absolute value, not an accumulating value. As such, an error in half hour data is not self correcting, and there are stringent requirements on the data capture and handling of HH meter readings. These meters are normally read electronically due to the large amount of information, and the majority of the 10,000 or so of these meters in New Zealand are read remotely. Due to the expense of data handling and meter complexity, these meters are usually only installed on larger sites. The resolution of information by half hour gives very good information on consumption patterns within a consumer's site, and allows prices to reflect the cost of supply of transmission, lines, and energy if these prices are available.

Non half hour meters

6. Non half hour (NHH) meters are meters that record the volume of energy consumed as an accumulating register (such as the odometer on a vehicle). These types of meters have been around for quite some time, and the method of gathering and processing electricity consumption has changed little over the last 100 years. The energy consumed over the period is the difference between readings at the start and end of the consumption period. As the readings are accumulating, any error in the meter read is corrected by the retailer on the next actual read. However, as only the total consumption is available, the resolution of information with these meters is limited to an average. To give increased resolution, additional registers may be added to the meter, and these registers may be turned on and off at certain times of the day by either a time clock (may be internal) or an external signal. Two register meters that provide day and night consumption separately have been in use for about the last thirty years.

Metering installations

7. Metering installations are a collection of components that quantify the flow of electricity at a point of connection, and may comprise NHH or HH meters, and control devices as specified within part A of the Rules. These installations must have current certification from an approved test house in accordance with code of practice D2 of schedule D1 of the Rules in order for the meter readings to be used in the market reconciliation process.

Control devices

8. Control devices are relays that allow control of load or meter registers on a consumer's site, usually by injection of a 'ripple' signal but may use a variety of other communication methods e.g. pilot wires or time clocks.

Meter readings

9. Meter readings are the readings of the meter register itself. There are particular requirements in rule 5 of code of practice G1 of schedule G8 of part G of the Rules relating to the reading and handling of information that is to enter the reconciliation process from meter installations.

Meter equipment owner or meter owner

10. This term describes the participant that owns any of the components that comprise a metering installation.

Test houses

11. Responsible for the installation and certification of metering installations as distinct from being the owner of the equipment. Meter testing and installation can only be carried out by market administrator approved test houses. Code of practice D2 of schedule D1 of part D of the Rules details the requirements for the installation certification and recertification process of metering installations, as well as the approval process for test houses. The object of this process is to ensure that metering installations are accurate and are maintained in a state of accuracy.

Data administrators

12. Responsible for the collection of metering information and the formatting and presentation of this information into the market reconciliation process. Meter reading and data handling can only be carried out by market administrator certified data administrators. Code of practice G1 of schedule G8 of part G of the Rules details the requirements for the certification and recertification process of data administrators. The object of this process is to ensure that metering is accurate and traceable and is maintained in a state of accuracy.

Buyer or retailer

13. Where the buyer or retailer purchases electricity from the electricity market within a local or embedded network, the buyer or retailer is responsible for the accuracy and certification of metering installations, collection of metering information, and settlement of the physical consumption volume in the reconciliation process (refer rule 3 of part D of the Rules and rule 5 of code of practice G1 of schedule G8 of part G of the Rules).

Seller or generator

14. Where the seller or generator sells to the electricity market, the seller or generator is responsible for the accuracy and certification of metering installations, collection of metering information, and settlement of the physical generation volume in the reconciliation process (refer rule 3 of part D of the Rules and rule 5 of code of practice G1 of schedule G8 of part G of the Rules). Note

that the asset owner is responsible when it is expected that electricity will predominantly flow into the grid.

Grid owner

15. Grid owners, where determined by the Board in rule 2 of part D of the Rules, are responsible for the accuracy and certification of metering installations, collection of metering information, and settlement of the physical generation volume in the reconciliation process when it is anticipated that electricity will flow predominantly out of the grid.

Embedded network owner

16. Embedded network owners have particular obligations for the accuracy and certification of metering installations, collection of metering information, and settlement of the physical consumption volume in the reconciliation process for the point of connection with a local network.

Current technology

17. The current metering employed in the vast majority of installations in New Zealand uses stand-alone single or three phase meters which are read manually on site.
18. Some metering installations have a load management capability; this consists of a control device usually installed in the consumer's meter box. This control device can be used by the distribution company to remotely control load on a consumer's premises. This control may be exercised to control peak on either the distributor's network or the grid. Typically load is controlled when the application compromises storage, e.g. hot water storage heating or night storage heating.
19. Metering installations are categorised according to capacity, and accuracy requirements increase as capacity also increases. These categories are outlined in schedule D1 of part D of the Rules. The table below has been modified from the table in schedule D1 of part D of the Rules to provide additional estimated information.

Meter category	Voltage	Current transformer ratio	Multiplier	kVA		Certification date	Meter type
				Max	Typical		
0	230/400	Up to 3,000 kWh/year				None	Unmetered load
1	230	0	0 - 3	<23	20	1/04/2015	NHH/HH
1	400	0	0 - 3	<70	50	1/04/2015	NHH/HH
2	230	0 - 500	4-100	<115	50 - 100	1/04/2010	NHH/HH
2	400	0 - 500	4-100	<345	50 - 300	1/04/2010	NHH/HH
3	400	500 - 1200	100 - 240	345 - 830	300 - 600	1/04/2004	HH
3	400v - 11kV	0 - 100	1000 - 2000	<1900	<1,500	1/04/2004	HH
4	400	1200 - 2000	240 - 400	830 - 1,385	600 - 1,000	1/10/2000	HH
4	400v - 11kV	100 - 200	2000 - 4000	<3,800	1,500 - 3,800	1/10/2000	HH
5	400v - 11kV	200 - 300	4000 - 6000	1,900 - 5,700	1,000 - 4,000	1/10/2000	HH
6	400v - 11kV	>300	>6000	>5,700	<5,000	1/10/2000	HH
6	>11kV	>300	>6000	0 - 17,000	>5,000	1/10/2000	HH

Metering installation categories

General

20. Where the information from meters is used in the electricity market reconciliation process, those meters must be installed and certified in accordance with code of practice D3 of schedule D1 of part D of the Rules, and read in accordance with the requirements in rule 5 of code of practice G1 of schedule G8 of part G of the Rules.
21. Metering installations may comprise a number of different components such as meter and control devices, and there may be different owners of each of these components.
22. Metering installations are used to quantify and record the volume of electricity that passes through a point of connection, and may record both consumption (extraction) and generation (injection) volumes.
23. The following participants in the electricity market have an interest in metering installations, and have obligations under the Rules:
 - a. meter equipment owners or meter owners;
 - b. test houses;
 - c. data administrators;

- d. buyers or retailers;
- e. sellers or generators;
- f. embedded network owners; and
- g. the grid owner.

Categories 1 and 2

- 24. Metering Installation Categories 1 and 2, unless they have been replaced with advanced metering systems, are unlikely to have the capability to be read remotely.
- 25. Where there is centralised load management, the distributor may elect to provide a separate tariff for controlled electricity. Tariffs may be offered in network areas by retailers who may pass these savings on to consumers with the price reflecting the availability of electricity, for example:
 - a. anytime: charges where the supply of electricity is not controlled;
 - b. night only: supply only available to be used at night (usually controlled), but unavailable during constraint periods;
 - c. controlled use: this is subject to network control and also subject to a distributor's load control policy; and
 - d. day/night: charges where the supply of electricity is not controlled, and the meter is fitted with two registers, only one of which may be active at any one time. Typically the day register is active between 7 am and 11 pm, and the night register is active between 11 pm and 7 am, but these times may vary depending on the distributor's pricing policy.
- 26. Category 1 and 2 metering installations are generally NHH meters, but at the retailer's discretion may be HH meters.
- 27. With NHH meters, the energy consumed over a billing period is the difference between the readings at the start and end of the period. As the readings are accumulating, any errors in the reading or data handling process for the period are corrected by the retailer at the time of the next actual reading.
- 28. With NHH meters, only the total consumption over a period is available when using only one meter register. Therefore to give increased resolution, additional registers may be added to the metering installation. These registers can be turned on and off at certain times of the day by either a time clock (may be internal) or an external signal. Dual register meters that provide day and night consumption separately are in general use.
- 29. The requirement for the frequency of meter reading is contained in rule 5 of code of practice G1 of schedule G8 of part G of the Rules. Accurate and frequent

meter readings are required for the reconciliation process and for NHH metered sites without remote communications.

Categories 3 – 6

30. Only metering installations in categories 3 and above are required by rule 3 of code of practice D1 of schedule D1 of part D the Rules to have HH meters.
31. HH meters are meters that record the energy consumed in each half hour period, therefore the volumes of information are significant. The volume is recorded as an absolute value, not an accumulating value. As such, an error in half hour data is not self correcting, and there are more stringent requirements on the data capture, time keeping, and data handling of HH meter readings.
32. HH meters are normally interrogated electronically due to the large amount of information to be gathered. The majority of the approximately 10,000 of these meters in New Zealand are currently read remotely via modem land line or cell phone while newer meters may be read via the internet.
33. Due to the expense of data handling and meter complexity, these meters are usually only installed on larger sites. The resolution of information by half hour provides good information on consumption patterns within a consumer's site, and allows for time of use (TOU) tariffs to reflect the cost of supply.

Issues with energy metering stock

Credit control and vacant premises

34. Control of electricity consumption in vacant properties is often exercised by disconnecting the supply.
35. Credit control, as a last resort, is exercised by disconnecting the supply.
36. Currently to connect or disconnect a property, a service person must visit the site. It is expected that new metering technology will enable supply to be connected and disconnected remotely.
37. The structure of products that can be offered is dependent on the type and configuration of the meter and control device that form the metering installation, and the frequency of meter reading.
38. The standard metering installation configurations and types of meter only provide for information on aggregate consumption over a period between meter readings and these limit the products and services that can be offered by a retailer. Retailers can only offer tariffs based on the metering that is installed unless they go to the expense of replacing the metering installation.

Consumer information

39. Most consumers do not relate to the way electricity is measured and charged. Most metering systems (with the exception of some prepayment systems) present information on invoices only as the numbers accumulating on kWh registers and the difference between successive readings. The resolution and type of this information does not allow consumers to have a visible 'fuel gauge' inside their premise.

Age of metering installations and associated equipment

40. Although HH meters in categories 3 and above are well managed and should comply with the requirements of part D of the Rules, most NHH meters only have what is called 'interim compliance'. This compliance expires either on 1 April 2010 for category 2 meters or 1 April 2015 for category 1 meters. Although current metering stock is reasonably aged, it is by no means inaccurate. The need to ensure compliance with the Rules by the above dates can be achieved by the following:
- a. For meters of accuracy class 2.0, the date may be extended provided the approved test house responsible for the metering installation applies a satisfactory programme of statistical samplings as described in rule 4.8 of code of practice D3 of schedule D1 of part D of the Rules.
 - b. Replacement of the existing stock and certification in accordance with code of practice D3 of part D of the Rules by an approved test house.
41. Also to be considered is the age and condition of associated equipment that may be a part of the metering installation such as the load control device. Meter replacement programmes should ideally also include upgrade of this plant at the same time, or determine if the functionality should be integrated into the metering system.

Sources of information

42. The Rules can be found on the Commission's website at:
<http://www.electricitycommission.govt.nz/govern/regs/index.html>
43. If you require further assistance, please contact the Retail Operations Assistant:

C/o Electricity Commission
P O Box 10041
Wellington
Attention: Retail Operations Assistant

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